

REMARKS

Claims 1, 4-7 and 11-12 are presently pending, of which claim 1 is an independent claim. Claims 1, 4-7, 11 and 12 are being rejected under 35 U.S.C. § 103(a) as being unpatentable over a new reference, **Kitahara et al.** (U.S. Patent No. 6,290,340), in view of **Sugitani et al.** (U.S. Patent No. 4,611,219). This rejection is traversed.

Kitahara et al. are alleged to teach a head for an ink-jet printer comprising a substrate 42, on which are provided a plurality of ink nozzles 54 and a plurality of ink passages 56 each communicating separately to each of the ink nozzles, and an inorganic substrate which is joined to substrate 42 and provided with ink chambers 46 each communicating separately to each of the ink passages. **Kitahara et al.** are also said to teach a piezoelectric element of ferroelectric substance (col. 9, lines 5,6) for changing separately a capacity of each of the ink chambers to jet an ink from the ink nozzles 54 through the ink chambers 46. The ink passages 56 are said to be fine as compared with the ink chambers 46 and the ink nozzles are fine as compared with the ink passages (citing Fig. 1).

Sugitani et al. are cited for the alleged teaching that a substrate can be a silicon substrate (citing col. 3, lines 22-23) able to be processed finely using a plasma etching method (citing col. 3, line 27).

1. THE 35 U.S.C. § 103 REJECTION OF CLAIMS 1, 4-7 AND 11-12 IS IMPROPER

Kitahara et al. teach that the material used for plates 48, 50, and 52 are "preferably made of a plastic, or a metal such as nickel or stainless steel . . . orifices 58 . . . desirably formed in a tapered shape" (col. 6, lines 10-21). **Kitahara et al.** teach that the nozzles are formed in the plates by a press (see col. 15, lines 28-39).

Sugitani et al. teach that "plates 5, 11, 12, and 14 can be formed from any material suitably selected from silicon, glass, ceramics, plastics, and metals" wherein the perforations "can be accomplished by various methods including drilling, molding, punching, etching, a method that photoresist is image-exposed and developed, followed by removing the portions corresponding to the perforations and openings by dissolution" (col. 3, lines 22-30).

Moreover, Applicant submits that **Sugitani et al.**'s recitation of "silicon, glass, ceramics, plastics, and metals" is nothing more than a parallel recitation intended to cover practically every material under the sun and that **Sugitani et al.** do not suggest any idea of particularly selecting a silicon substrate from among the possible listed materials.

Stated differently, a skilled artisan seeking to produce a fine mask pattern in a material having no knowledge of the claimed invention, would not have been motivated to particularly select silicon for application and processing in the manner claimed from the countless materials and compositions covered by the overarching recitation of "silicon, glass, ceramics, plastics, and metals".

In rejecting a claim under 35 U.S.C. §103, the Examiner is required to identify a source in the applied prior art not only for claim limitations, but also for the requisite *motivation* to modify an applied reference or to combine applied references with a reasonable expectation of successfully achieving a specific benefit. *Smiths Industries Medical Systems v. Vital Signs, Inc.*, 183 F.3d 1347 (Fed. Cir. 1999). Applicant respectfully submits that picking and choosing of elements from a reference, absent a clear suggestion or motivation to do so, is improper, in that the Examiner has failed to discharge the judicial requirement for identifying a basis why one having ordinary skill in the art would have been *realistically* motivated, based on the teaching of

Sugitani et al., to particularly select silicon from amongst every other of the practically infinite materials listed therein. *In re Deuel*, 51 F.3d 1552 (Fed. Cir. 1995). Applicant accordingly submits, that one skilled in the art faced with the problems faced by Applicant would not reasonably have been motivated to combine and modify **Sugitani et al.** and **Kitahara et al.** in the manner alleged and respectfully request reconsideration and withdrawal of this 35 U.S.C. § 103(a) rejection for at least this reason.

Applicant further submits that the "etching" described in **Sugitani et al.** is a *chemical etching*, not a plasma etching. Therefore, Applicant submits that the combination of **Sugitani et al.** and **Kitahara et al.** do not teach or suggest micro-fabrication of nozzles by plasma etching to provide the claimed "plurality of ink nozzles and a plurality of ink passages each communicating separately to each of the ink nozzles are processed finely using a plasma etching method". Applicant therefore further submits that the combination of **Sugitani et al.** and **Kitahara et al.** does not teach or suggest each and every aspect of the rejected claims, as required by 35 U.S.C. § 103 and reconsideration and withdrawal of this 35 U.S.C. § 103(a) rejection is requested for at least this reason.

2. THE 35 U.S.C. § 103 REJECTION OF CLAIMS 5-6 IS IMPROPER

Kitahara et al. are alleged to teach "said silicon substrate has a construction in which plural silicon substrates are laminated and wherein said ink nozzles and said ink passages are communicated by laminating the silicon substrate in which said ink nozzles are processed and the silicon substrate in which said ink passages are processed" (citing col. 6, lines 50-68).

Applicant submits **Kitahara et al.** set forth no such teaching. **Kitahara et al.** teach a pressure generating unit formed by lamination, stating "each of the piezoelectric transducers 78 has a piezoelectric/electrostrictive unit consisting of a lower electrode 77, a

piezoelectric/electrostrictive layer 79, and an upper electrode 75, which are formed in lamination on a closure plate 66, by a suitable film-forming method." (col. 7, lines 53-62). Since the pressure generating unit 44 "is formed as an integral fired ceramic structure, [it] does not require any particular adhesive treatment for bonding the plates 66, 68, 70 together." (col. 7, lines 7-10). **Kitahara et al.** also describe formation of the flow path unit 42 comprising nozzle plate 48, orifice plate 50, and channel plate 52 (each of these components being formed from a plastic or metal) using an adhesive (see, e.g., col. 10, lines 4-39).

Applicant submits that neither **Sugitani et al.** nor **Kitahara et al.** teach or suggest, singly or in combination, formation of an ink nozzle and ink path by lamination of *plural silicon substrates*, as alleged. Reconsideration and withdrawal of this aspect of the 35 U.S.C. § 103(a) rejection is requested for at least this reason.

3. THE 35 U.S.C. § 103 REJECTION OF CLAIM 12 IS NOT FACTUALLY SUPPORTED

Regarding the recited pitch of 20 μm (claim 12), the Examiner acknowledges that neither **Kitahara et al.** nor **Sugitani et al.** expressly teaches this spacing. The Examiner notes that the claim recite an ink nozzle pitch of about 20 μm and, apparently taking official notice states that this pitch "serves the purpose to better facilitate ink flow". The Examiner acknowledges that **Kitahara et al.** does not teach a pitch of 20 μm , but does "provide tapering of the nozzles to better facilitate ink flow" (citing col. 6, lines 15-21). The Examiner then uses this correlation to conclude that "[i]t would have been obvious to one having ordinary skill in the art . . . to have a pitch of the ink nozzles is approximately 20 μm in the modified **Kitahara et al.** for the purpose to better facilitate flow".

It is submitted that this allegation is factually deficient and legally improper. **Kitahara et al.** state, in fact, that "[e]ach of the orifices 58 is desirably formed in tapered shape such that the diameter of the orifice 58 is reduced in the direction of *flow* of the ink (i.e., the direction from the ink supply channel 62 toward the ink pressure chambers 46), as shown in FIG. 1 by way of example, so as to function as a check valve for inhibiting the ink from flowing in the reverse direction." (col. 6, lines 15-21). Thus, **Kitahara et al.** teach only that reducing the diameter of the orifice 58 serves to inhibit reverse flow - not to "better facilitate flow" in an output direction.

Kitahara et al. are, in fact, silent as to the proffered correlation between a tapered nozzle and facilitation of flow stands. A textual search of **Kitahara et al.** for the terms "spacing" or "pitch" comes up empty. The only connection between the claimed recitation of nozzle spacing and **Kitahara et al.** is the Examiner's allegation that, somehow, one skilled in the art would (1) look to **Kitahara et al.** and improperly surmise that **Kitahara et al.**'s teaching of reducing the orifice 58 diameter serves to "better facilitate flow" in an output direction; (2) mysteriously conclude from **Kitahara et al.**'s teaching of nozzle tapering that spacing the nozzles closes together would "better facilitate flow"; and (3) provide the claimed spacing of nozzles to "better facilitate flow".

The Examiner's assertion that closing spacing of the nozzles (i.e., reduced pitch) would "better facilitate flow", the very motivating factor for the rejection, is without evidentiary support in the record. To the extent that the Examiner is setting forth an undeclared expression of Official Notice, such Official Notice is traversed.

The Examiner is reminded that "Official notice without documentary evidence to support an examiner's conclusion is permissible in some [rare] circumstances" and should only be taken

where the facts asserted are "capable of instant and unquestionable demonstration as being well-known". A *prima facie* case of obviousness requires the examiner to present evidence, preferably in the form of some teaching, suggestion, incentive or inference in the applied prior art, *or in the form of generally available knowledge at the time of the invention*, that would have led one of ordinary skill in the art to combine the relevant teachings in the proposed manner to arrive at the claimed invention. See, e.g., *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993); *Carella v. Starlight Archery*, 804 F.2d 135 (Fed. Cir. 1986). The Examiner may only take official notice of facts outside the record which are capable of instant and unquestionable demonstration as being "well-known" in the art. *In re Ahlert*, 424 F.2d 1088, 1091 (CCPA 1970).

Applicant submits that the alleged "facts" that nozzle tapering of finely formed ink jets improve flow and that decreased pitch of ink jet nozzles "better facilitates flow" has not been shown to be premised upon what was well-known in the art at the time of the invention. Instead, Applicant teaches that such line spacing permits improved image fidelity (see, e.g., page 3, lines 21-25). **Kitahara et al.** appear to teach that smaller nozzle diameters *increase* resistance to flow, thereby permitting the nozzle to function as a check valve. **Sugitani et al.** similarly teach that smaller flow diameters *increase* resistance, noting "expanded widths . . . having much decreased resistance to ink flow" and "liquid paths having reduced flow resistance can be disposed in lower density" (col. 6, lines 3-17)). In short, there is absolutely no teaching or suggestion in the cited references to support the general allegation that "[i]t would have been obvious to one having ordinary skill in the art . . . to have a pitch of the ink nozzles is approximately 20 μ m in the modified **Kitahara et al.** *for the purpose to better facilitate flow*" (emphasis added). Thus, the Examiner's "Official Notice" is not supported by the applied

references and such exercise of "Official Notice" is traversed. Absent the benefit of the facts so asserted in the "Official Notice", the rejection of claim 12 over the combination of **Kitahara et al.** and **Sugitani et al.** is factually deficient and has not been independently shown to teach and suggest each and every element of the claimed invention as required under 35 U.S.C. § 103. Withdrawal of this aspect of the rejection and allowance of the subject matter of claim 12 is therefore requested.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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